

papla, cDNA and translated amino acid sequence:

I C F L L D D S T T F R N G T L N R G M	60
ATTGCTTCTTGTAGATGATTCGACGACATTTAGAAATGGTACCTTGAATAGAGCATG	
S P D C T F N E K D I V F Y V Y S R D K	120
TCTCCGGATTGTACTTTTAATGAGAAAGATATAGTATTCTATGTTTACTCAAGGGATAAG	
R D G I I L K K E T L T N Y D L F T K S	180
CGAGATGGTATTATTCTTAAGAAAGAAACTTTAACGAATTACGATCTGTTTACAAAGTCT	
T I S K Q V V F L I H G F L S T G N N E	240
ACAATATCAAAACAAGTTGTATTTCTTATACATGGTTTCCTTTCAACTGGGAATAATGAA	
N F V A M S K A L I E K D D F L V I S V	300
AACTTCGTTGCTATGTCGAAAGCTTAAATAGAAAAAGATGATTTTCTTGTAATTTCCGGTC	
D W K K G A C N A F A S T K D A L G Y S	360
GACTGGAAGAAGGTGCTTGTAAATGCTTTTGCTTCAACAAGGATGCTTTGGGTTATCC	
K A V G N T R H V G K F V A D F T K L L	420
AAAGCCGTTGGAACACACGTCACGTTGGAAAATTGTAGCTGATTTACAAAACACTT	
V E K Y K V L I S N I R L I G H S L G A	480
GTAGAAAATATAAGTGCTGATATCAAAATATACGATTGATCGGGCATAGTTTGGGCGCG	
H T S G F A G K E V Q K L K L G K Y K E	540
CATACTTCAGGTTTGC GGAAAAGAAAGTTCAAAAGTTAAAAATTAGGAAAAATACAAGGAA	
A A	

Figure 1A

A . - - - - - A

I I G L D P A G P Y F H R S D C P D R L
ATTATCGGGCTTGATCCTGCTGACCGTATTTTCATCGGAGTGACTGTCCGACAGACTT 600

C V T D A E Y V Q V I H T S I I L G V Y
TGGTAAACAGACGCAGAAATATGTTCAAGTTATACATAACATCAATCATATTAGGAGTATAT 660

Y N V G S V D F Y V N Y G K N Q P G C N
TATAATGTTGGTAGCGTTGATTTCTACGTGAATTATGGAAAAAATCAACCTGGTTGCAAT 720

E P S C S H T K A V K Y L T E C I K H E
GAACCATCCTCTCATACGAAAGCCGTGAAATATCTGACTGAGTGCATAAAACATGAA 780

C C L I G T P W K K Y F S T P K P I S Q
TGTTGTTTAATTGGAACACCATGGAAGAAATATTTTCAGCACTCCAAACCAATTTCCCAG 840

C R G D T C V C V G L N A K S Y P A R G
TGCAGAGGAGACACCTGTGTTGCGTTGGATTGAATGC AAAAGTTATCCTGCTAGAGGC 900

A F Y A P V E A N A P Y C H N E G I K L
GCATTTTATGCACCGGTTGAAGCAAATGCACCTTATTGCCATAACGAGGGGATTAAACTT 960

*
TAATTATAACAAAAGTCAATGTACACAAAAATGTATCTATTGATGAATATTAATGAAT 1020

AAACGAAACAGTCAAATAAAAAA 1048

Note: The amino acid sequence ICFL.....GTLNR represents a portion of the leader sequence, as
Venom protein has the sequence of GMSPD.....

Figure 1B

papla, intron 1, (between nucleotides 111-112; see papla file):

AGGTAATAATCTCGATTCTATGCGTACGCGATTTTGTGATTATTTTCAAGAAATGTA	60
AGAAAAATTTTAAATAATATTACTGAAGTATGAAATAAAAACTTTATACTTT	114

Figure 2A

papla, intron 2, (between nucleotides 720-721; see papla file):

GGTAATATTTTATATAAATGAACAATTCTATGGAATAGAAATAGTACAAGCATCGAT	60
TATATCCTATGCCCTTGTTATATGATTTCCGGAGTTAGACACTATTATTTTAAATAATTTT	120
TACATTA	127

Figure 2B

Vespid plas:

- wfh, white face hornet (D. maculate); vv, yellow jacket (V. vulgaris); pa, wasp (P. annularis):

	1				50
wfh	~FVCPFSN	DTVMI FLTR	ENRK.HDFYT	LDTMNRHNEF	KKSIKRPVV
vv	~GPKCPFNS	DTVSIIE TR	ENRN.RDLYT	LQTLQNHPEF	KKKTITRPVV
pa	GMSPDCTFNE	KDIVFYVYSR	DKRDGIILKK	E.TLTNYDLF	TKSTISKQVV
	51				100
wfh	F.ITHGFTSS	ATEKNFVAMS	EALMHTGDFL	IIMVDWRMAA	CTDEYPGLKY
vv	F.ITHGFTSS	ASETNFINLA	KALVDKDNYM	VISIDWQTAA	CTNEAAGLKY
pa	FLI.HGFLST	GNNENFVAMS	KALIEKDDFL	VISVDWKKGA	C.NAFASTKD
	101				150
wfh	.MFYKAAVGN	TRLVGNFIAM	IAKKLVEQYK	VPMTNIRLVG	HSLGAHISGF
vv	.LYYPTAARN	TRLVGQYIAT	ITQKLVKHYK	ISMANIRLIG	HSLGAHISGF
pa	ALGYSKAVGN	TRHVKGK FVAD	FTKLLVEKYK	VLISNIRLIG	HSLGAHISGF
	151				200
wfh	AGKRVQELKL	GKFSEIIGLD	PAGPSFKKND	CSEICETDA	HYVQILHTSS
vv	AGKRVQELKL	GKFSEIIGLD	PARPSFDSNH	CSERLCETDA	EYVQIIHTSN
pa	AGKRVQELKL	GKFKEIIGLD	PAGPYFHRSD	CPDRLCVTDA	EYVQVIHTSI

A-----A

Figure 3A

A - - - - - A

201					251
wfh	NLGTERTLGT	VDFYNNNGSN	QPGCRYIIGE	TCSHTRAVKY	FTECIRRECC
vv	TLGTEKTLGT	VDFYMNNGKN	QPGCGRFFSE	VCSHSRAVIY	MAECIKHECC
pa	ILGVYYNVGS	VDFYVNYGKN	QPGCNEPS..	.CSHTKAVKY	LTECIKHECC
251					300
wfh	LIGVPQSK..	.SPQPVSCKT	RNECVCVGLN	AKKYPKRGSF	YVPVEAEAPY
vv	LIGPKSK..	.SSQPISSCT	KQECVCVGLN	AKKYPSRGSF	YVPVESTAPF
pa	LIGTPWKKYF	STPKPISQCR	GDTCCVCVGLN	AKSYPARGAF	YAPVEANAPY
301					
wfh	CNNNGKII				
vv	CNNKGKII				
pa	CHNEGIKL				

Figure 3B

Pahya, cDNA and translated amino acid sequence:

	Y V S L S P D S V F N	
	TATGTGTCATTGTCCCCGACTCAGTATTAA	480
I I T D D I S H Q I L S R S N C E R S K		
TATCATCACCGATGACATCTCCACCAAAATTCTTCCAGATCGAAATTGTGAAAGATCCAA		540
R P K R V F S I Y W N V P T F N C H Q Y		
AAGACCGAAAAAGGTCTTCAGCATTTATTGGAACGTTCTACCTTTATGTGCCCAATA		600
G M N F D E V T D F N I K H N S K D N F		
TGGCATGAATTCGACGAGGTGACAGATTTTAATATCAAAACATAATTCTAAGGACAATTT		660
R G E T I S I Y Y D P G K F P A L M P L		
TCGCGGTGAAACTATATCAATTTATTACGATCCTGGAAAAATTTCCAGCATTGATGCCACT		720
K N G N Y E E R N G G V P Q R G N I T I		
AAAAATGGTAATTATGAGGAAAGAAACGGAGGGTTCTCTCAGCGAGGTAAACATCACGAT		780
H L Q Q F N E D L D K M T P D K N F G G		
ACATTTGCAACAATTAAACGAAGATTGGATAAAATGACACCGGATAAAAAATTTTCGGTGG		840
I G V I D F E R W K P I F R Q N W G N T		
TATCGGTGTAATCGATTCGAAAGATGGAACCGATTTCGACAGAAATTGGGGTAACAC		900
E I H K K Y S I E L V R K E H P K W S E		
GGAAATACATAAGAAATATTCTATTGAACTCGTTCGGAAAGAAACATCCAAAGTGGAGCGA		960

A · - - - - - A

Figure 4A

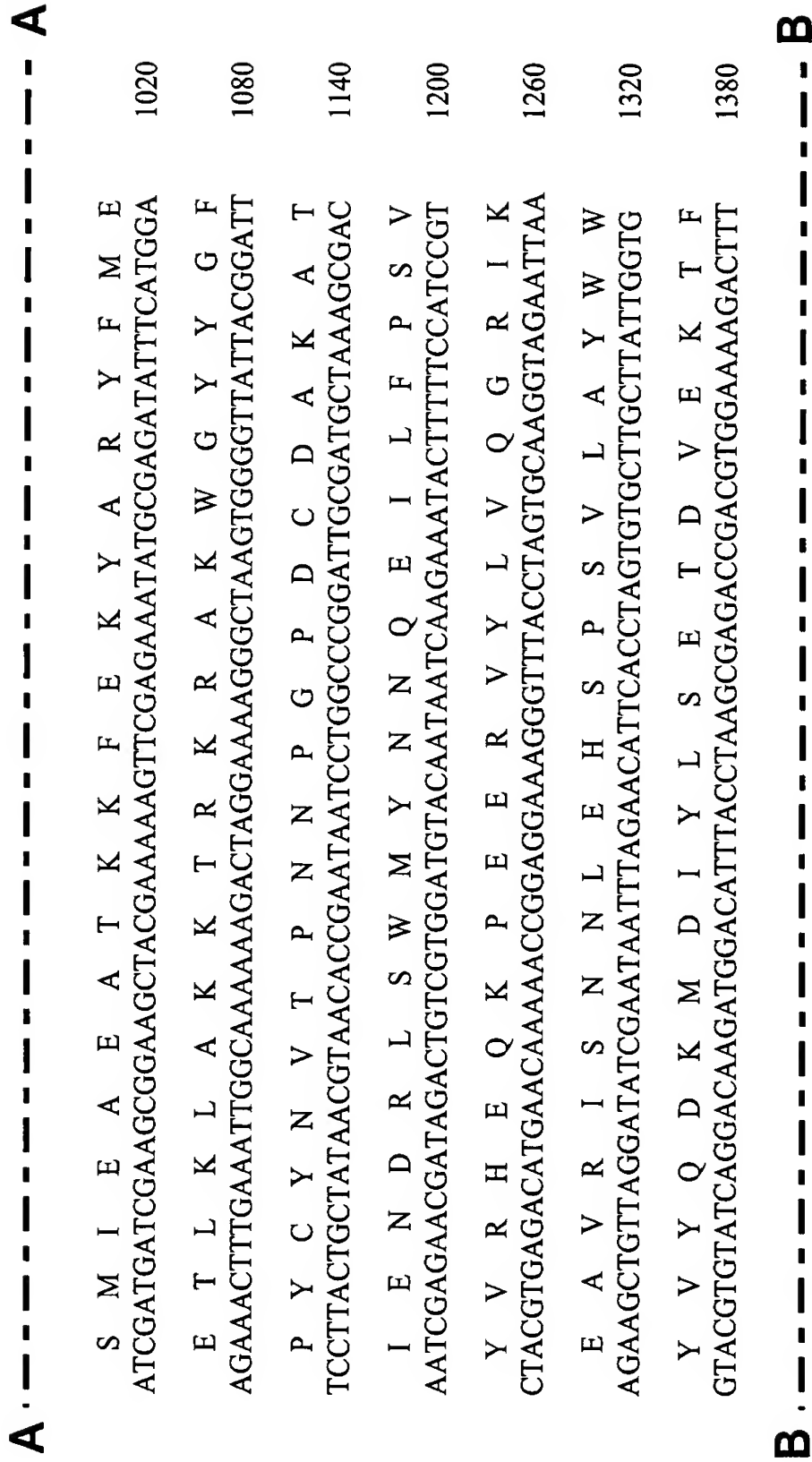


Figure 4B

B . - - - - - **B**

Q E I V T N G G D G I I I W G S S D V
CCAAGAGATAGTACTAATGTTGGGATGGTATCATAATATGGGTAGCTCGTCCGATGT 1440
N S L S K C K R L R E Y L L N T L G P F
TAACAGCCTAAGTAAATGTAAGAGATTGAGAGAGTACCTGTAAACACTTTAGGACCGTT 1500
A V N V T E T V N G R S S L N F *
CGCGGTTAATGTAAACAGAACTGTCAACGGAAGATCATCCCTAAACTTCTAAATAATCG 1560
ATAACGCCCTAATCACGTCGATGATTATTAGGGTGTCTTCGGTGATTGGTTTGATCT 1620
CACTGAAAAGACTTTTCGTTAAAAACAAAAAGATAAATGTAAATTTATAAGTTAAAAAA 1680
CCTATACGACCAAGAAAGAAAGAAAAAAGAAAAA

Note: The amino acid sequence YVSLSP.....RSNCER represents a portion of the leader sequence as the venom protein has the sequence of SKRPKR.....

Figure 4C

pahya, intron sequence, (between nucleotides 733 and 734):

ATTTTCTACTACAGTTCTTTTATCTCTCTATCATTGATGATAAATCGTTTAAATCGAT
60

CTATTGTAAATTATCTATCGATTGTTTAGGCAA 94

Figure 5

A-----A

Figure 6A

A-----A

251					300
wfh	NLKHS.PKVL	SYWWVYVYQDD	TNTFLTETDV	KKTFQEIAIN	GGDGHIWGS
wv	NLKHS.PKVL	SYWWVYVYQDE	TNTFLTETDV	KKTFQEIVIN	GGDGHIWGS
pa	NLKHS.PKVL	AYWWVYVYQDK	MDIYLSETDV	EKTFQEIVTN	GGDGHIWGS
bv	QMTTSRKKVL	PYYWYKYQDR	RDTDLSRADL	EATLRKITDL	GGDGHIWGS
301					
wfh	SSDVNSLSKC	KRLREYLLTV	LGPI TVNVTE	TVN~~~~~	~~~~~
wv	SSDVNSLSKC	KRLQDYLLTV	LGPIANINVTE	AVN~~~~~	~~~~~
pa	SSDVNSLSKC	KRLREYLLNT	LGPF AVNVTE	TVNGRSSLNF	~~~~~
bv	SDDINTKAKC	LQFREYLNNE	LGPAVKRIAL	NNNANDRLTV	DVSVDQV*

Figure 6B